

UP-TO-DATE CONTENT OF ARTIFICIAL RADIONUCLIDES ON FLOODPLAIN AND IN BOTTOM SEDIMENTS OF THE TOM AND OB RIVERS IN THE AREA INFLUENCED BY DISCHARGES FROM SIBERIAN CHEMICAL COMBINE

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The last reactor of the Siberian Chemical Combine (SCC) was shutdown in June, 2008. SCC, formerly known as Tomsk-7, is located in Seversk in the Tomsk Region of the Russian Federation. Being mainly intended for production of weapon-grade plutonium and high enriched uranium, the SCC was put into operation in 1953. Main contribution into radionuclide content in SCC process water discharged into the Tom river was given by the single pass reactors which were gradually removed from service. Now there are plans for construction of the Seversk NPP in the SCC area, what is an important factor determining the need for being aware of current radiation situation on the Tom and Ob rivers downstream of the SCC. Awareness of the initial radioactive situation is essential for the future monitoring of influence of discharges from the Seversk NPP on contamination of water environment, which will be conducted in conditions of radioactive contamination due to previous SCC discharges. Information on present-day content of artificial radionuclides in flood-plain soils and bottom sediments is of special interest. Because of radionuclide accumulation (first of all, long-lived) while previous SCC discharges these water environment objects could remain contaminated a long time, in spite of termination of discharges from the single pass reactors into the Tom river.

In August-September 2008, within International Science and Technology Center (ISTC) Project No. 3547 "Analysis of Radionuclides Transport and Assessment of Radiation Risk for the Population and Environment in the Basin of the Irtysh-Ob' River System", a radioecological survey of the Tom and Ob rivers was carried out (from Tomsk to their confluence). The report presents and discusses the data received on content of ^{137}Cs , $^{239,240}\text{Pu}$, ^{90}Sr and other artificial radionuclides in bottom sediments and flood plain soils on the investigated part of the river system.

The results of radionuclide analysis of flood-plain soil and bottom sediment samples taken after shutdown of the last SCC single pass reactor indicate no radiationally significant consequences of SCC activities for these objects of water environment. Accumulation of artificial radionuclides from the SCC discharges on the flood-plain and in bottom sediments along the right bank of the Tom river doesn't resulted in formation of grounds-radioactive wastes on the river banks and bottom. However, the density of flood plain soil contamination by long-lived ^{137}Cs in the area influenced by SCC liquid discharges is higher than regional technogenic background. There are local flood plain areas contaminated not only by ^{137}Cs , but also other gamma-emitters, such as ^{152}Eu and ^{60}Co .

The measured vertical profiles of long-lived ^{137}Cs in flood-plain soils on the right bank of the Tom river downstream from the SCC discharge point are characterized by significant increase of radionuclide specific activity with depth of sampling. From retrospective considerations, this fact reflects improvement of situation with radioactive contamination of water bodied in the SCC close-in zone while removing from service of the SCC reactors.